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LISTING OF CLAIMS:

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2 We claim:

3 1. (currently amended) A processing method for comprising digitally processing integer
4 transform data representing a phenomenon,
5 said phenomenon comprising one of: a spectral analysis, a spectrum analysis, an image, an audio
6 clip, or a video clip.
7 said integer transform data having an original precision as real domain data input for forward
8 transformation and quantization in forming said integer transform data, the method step
9 of digitally processing comprising:

10 employing only said integer transform data while performing an inverse transform of said
11 integer transform data to the real domain directly forming high-precision numbers
12 having a precision greater than said original precision; and

13 maintaining said greater precision while manipulating said high-precision numbers to
14 produce an effect in said one of: spectral analysis, spectrum analysis, image, audio
15 clip, or video clip.

16 2. (previously presented) A method as recited in claim 1, wherein said step of manipulating
17 results in manipulated high precision numbers, and further comprising converting said
18 manipulated high-precision numbers to integers and clipping the integers to an allowed
19 range forming converted data.

20 3. (original) A method as recited in claim 1, wherein the phenomenon is an image.

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- 1 4. (original) A method as recited in claim 1, wherein said effect is the chroma-key merging of
2 two data sets.
- 3 5. (original) A method as recited in claim 1, wherein said effect is the color correction of image
4 data.
- 5 6. (original) A method as recited in claim 3, wherein said effect is a 90 degree rotation of the
6 image.
- 7 7. (original) A method as recited in claim 1, wherein said high-precision numbers are floating
8 point numbers.
- 9 8. (original) A method as recited in claim 1, wherein said high-precision numbers are fixed
10 precision numbers including a fractional part.
- 11 9. (original) A method as recited in claim 1, wherein the step of performing employs an inverse
12 discrete cosine transform.
- 13 10. (original) A method as recited in claim 1, wherein the step of performing employs an inverse
14 discrete wavelet transform.
- 15 11. (original) A method as recited in claim 1, wherein the step of performing employs an inverse
16 discrete Fourier transform.
- 17 12. (withdrawn) A method for digitally processing transform data representing a phenomenon,
18 the method comprising:
- 19 performing an inverse transform of said transform data to the real domain forming
20 high-precision numbers; and

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- 1 performing a forward transform of said high-precision numbers.
- 2 13. (withdrawn) A method as recited in claim 12, wherein the inverse to said forward transform
3 is different from said inverse transform.
- 4 14. (withdrawn) A method as recited in claim 13, wherein said forward transform is a forward
5 discrete cosine transform and said inverse transform is an inverse discrete wavelet
6 transform.
- 7 15. (previously presented) A method as recited in claim 1, further comprising implementing an
8 inverse quantization of transform-coded data forming the integer transform data.
- 9 16. (original) A method as recited in claim 15, further comprising converting said high-precision
10 numbers to integers and clipping the integers to an allowed range forming converted data.
- 11 17. (original) A method as recited in claim 15, further comprising entropy decoding coded data
12 to form the transform-coded data
- 13 18. (original) A method as recited in claim 17, wherein said coded data are coded image data.
- 14 19. (original) A method as recited in claim 17, wherein said coded data are coded video data.
- 15 20. (original) A method as recited in claim 18, wherein said coded image data are in a JPEG still
16 image international standard format.
- 17 21. (original) A method as recited in claim 19, wherein said coded video data are in a MPEG
18 motion video international standard format.
- 19 22. (original) A method as recited in claim 15, wherein the step of performing employs an
20 inverse discrete cosine transform.

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1 23. (original) A method as recited in claim 15, wherein the step of performing employs an
2 inverse discrete wavelet transform.

3 24. (original) A method as recited in claim 15, wherein the step of performing employs an
4 inverse discrete Fourier transform.

5 25. (original) A method as recited in claim 15, wherein said high-precision numbers are fixed
6 precision numbers that include a fractional part.

7 26. (withdrawn) A method as recited in claim 12, further comprising manipulating said
8 high-precision numbers to produce an effect.

9 27. (withdrawn) A method for digitally processing transform-coded data representing a
10 phenomenon, the method comprising:

11 performing an inverse quantization of the transform-coded data forming transform data;

12 performing an inverse transform of said transform data to the real domain forming
13 high-precision numbers;

14 performing a forward transform of said high-precision numbers forming forward
15 transformed data; and

16 performing a quantization of said forward transformed data forming quantized data.

17 28. (withdrawn) A method as recited in claim 27, further comprising:

18 entropy decoding coded data forming transform-coded data employing entropy decode;

19 and

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- 1 entropy encoding the quantized data employing entropy encode forming encoded data.
- 2 29. (withdrawn) A method as recited in claim 27, further comprising manipulating said
- 3 high-precision numbers to produce an effect.
- 4 30. (withdrawn) A method as recited in claim 27, further comprising converting said
- 5 high-precision numbers to integers and clipping to an allowed range forming converted
- 6 data.
- 7 31. (withdrawn) A method as recited in claim 29, further comprising alternating manipulating
- 8 steps with the steps of performing a forward transform, performing a quantization,
- 9 entropy encoding, entropy decoding, performing an inverse quantization, and performing
- 10 an inverse transform a desired number of times.
- 11 32. (withdrawn) A method as recited in claim 31, wherein said coded data are compressed data,
- 12 and each step of alternating implements a compression/decompression cycle.
- 13 33. (withdrawn) A system employing the method recited in claim 31, wherein each step of
- 14 alternating recompresses and decompresses coded data to enable an editing operation.
- 15 34. (withdrawn) A method as recited in claim 28, wherein said coded data are coded audio data.
- 16 35. (withdrawn) A method as recited in claim 28, wherein said coded data are coded
- 17 electromagnetic environment data.
- 18 36. (withdrawn) A method as recited in claim 28, wherein said coded data are coded video data.
- 19 37. (withdrawn) A method as recited in claim 28, wherein said coded data is encoded in the
- 20 JPEG standard format.

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- 1 38. (withdrawn) A system for digitally processing first level transform-coded data in the real
2 domain representing a phenomenon, the system comprising:
- 3 a first inverse quantizer to generate transform data from said transform-coded data;
- 4 a first inverse transformer to produce an inverse transform of said transform data to the
5 real domain forming high-precision numbers;
- 6 a first forward transformer for forward transforming said high-precision numbers forming
7 forward transformed data; and
- 8 a first quantizer for quantizing said forward transformed data to form quantized data.
- 9 39. (withdrawn) A system as recited in claim 38, wherein the forward transformer employs a
10 different transform type than a first transform type employed by the inverse transformer.
- 11 40. (withdrawn) A system as recited in claim 38, wherein said forward transformer produces a
12 forward discrete cosine transform and said inverse transformer produces an inverse
13 discrete wavelet transform.
- 14 41. (withdrawn) A system as recited in claim 38, further comprising:
- 15 a manipulator for manipulating the high-precision numbers to produce an effect.
- 16 42. (withdrawn) A system as recited in claim 38, wherein said inverse quantizer and said
17 quantizer use identical quantization values.
- 18 43. (withdrawn) A system as recited in claim 41, wherein only a subset of the quantized
19 transform data produced different transform-coded data.

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1 44. (withdrawn) A system as recited in claim 38, wherein said inverse quantizer and said
2 quantizer use at least one different quantization value.

3 45. (withdrawn) A system as recited in claim 38, further comprising:

4 an entropy decoder to form the transform-coded data from coded data; and

5 an entropy encoder to encode the quantized data.

6 46. (currently amended) A system for digitally processing integer transform data representing a
7 phenomenon, said phenomenon comprising one of: a spectral analysis, a spectrum
8 analysis, an image, an audio clip, or a video clip, said integer transform data having an
9 original precision as real domain data input for forward transformation and quantization
10 in forming said integer transform data, the system comprising:

11 an inverse transformer to perform an inverse transform of the integer transform data to
12 the real domain directly forming ~~using~~ high-precision numbers having a precision
13 greater than said original precision employing only said inverse transform; and

14 a manipulator to manipulate the high-precision numbers to produce an effect in said one
15 of: spectral analysis, spectrum analysis, image, audio clip, or video clip, while
16 maintaining said greater precision.

17 47. (previously presented) A system as recited in claim 46, wherein said manipulator forms
18 manipulated high precision numbers, and further comprising a converter to convert said
19 manipulated high-precision numbers to integers, and a clipper to clip the integers to an
20 allowed range.

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1 48. (currently amended) A system for digitally processing transform-coded data representing a
2 phenomenon, said phenomenon comprising one of: a spectral analysis, a spectrum
3 analysis, an image, an audio clip, or a video clip, said transform coded data having an
4 original precision as real domain data input for forward transformation and quantization
5 in forming said transform coded transform data, the system comprising:

6 an inverse quantizer to perform an inverse quantization of said transform-coded data to
7 form integer transform data;

8 an inverse transformer to perform an inverse transform of said integer transform data to
9 the real domain directly forming high-precision numbers having a precision
10 greater than said original precision employing only said integer transform data;
11 and

12 a manipulator for manipulating the high-precision numbers to produce an effect in said
13 one of: a spectral analysis, a spectrum analysis, an image, an audio clip, or a video
14 clip, while maintaining said greater precision.

15 49. (original) A system as recited in claim 48, further comprising a converter to convert said
16 high-precision numbers to integers, and a clipper to clip the integers to an allowed range.

17 50. (withdrawn) A system for digitally processing transform data in the real domain representing
18 a phenomenon, the system comprising:

19 an inverse transformer to produce an inverse transform of the transform data to the real
20 domain to form high-precision numbers; and

21 a forward transformer to forward transform the high-precision numbers.

22 51. (withdrawn) A system as recited in claim 50, further comprising:

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1 a manipulator to manipulate the high-precision numbers to produce an effect.

2 52. (withdrawn) A system as recited in claim 41, wherein the quantized data forms an other level
3 of transform-coded data and further comprising:

4 another inverse quantizer, another inverse transformer, another manipulator, another
5 forward transformer, and another quantizer to perform together a similar function
6 on the other level of transform-coded data as performed on the first level
7 transform-coded data.

8 53. (withdrawn) A system as recited in claim 52, wherein the effect produced by the first
9 manipulator is a different type of effect from that produced by the other manipulator.

10 54. (withdrawn) A system as recited in claim 52, wherein the functions of the first inverse
11 quantizer, first inverse transformer, first forward transformer, and first quantizer, and the
12 respective functions of said another inverse quantizer, another inverse transformer,
13 another forward transformer, and another quantizer are each performed by a same
14 module.

15 55. (original) A method as recited in claim 2, further comprising providing said converted data
16 for use by an output device.

17 56. (original) A method as recited in claim 55, wherein the output device is a display monitor.

18 57. (original) A method as recited in claim 55, wherein the output device is a raster display
19 monitor.

20 58. (previously presented) A method as recited in claim 1, wherein the integer transform data
21 includes information of a spectral analysis.

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1 59. (currently amended) An article of manufacture comprising a computer usable medium having
2 computer readable program code means embodied therein for digitally processing integer
3 transform data representing a phenomenon, said phenomenon comprising one of: a
4 spectral analysis, a spectrum analysis, an image, an audio clip, or a video clip, said integer
5 transform data having an original precision as real domain data input for forward
6 transformation and quantization in forming said integer transform data, the computer
7 readable program code means in said article of manufacture comprising computer
8 readable program code means for causing a computer to effect:

9 employing only said integer transform data while performing an inverse transform of said
10 integer transform data to the real domain directly forming high-precision numbers
11 having a precision greater than said original precision; and

12 maintaining said greater precision while manipulating said high-precision numbers to
13 produce an effect in said one of: a spectral analysis, a spectrum analysis, an image,
14 an audio clip, or a video clip.
15

16 60. (original) An article of manufacture as recited in claim 59, the computer readable program
17 code means in said article of manufacture further comprising computer readable program
18 code means for causing a computer to effect converting said high-precision numbers to
19 integers and clipping the integers to an allowed range forming converted data.

20 61. (original) An article of manufacture as recited in claim 59, wherein the phenomenon is an
21 image.

22 62. (withdrawn) A computer program product comprising a computer usable medium having
23 computer readable program code means embodied therein for digitally processing
24 transform data in the real domain representing a phenomenon, the computer readable

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1 program code means in said computer program product comprising computer readable
2 program code means for causing a computer to effect:

3 performing an inverse transform of said transform data to the real domain forming
4 high-precision numbers; and

5 performing a forward transform of said high-precision numbers.

6 63. (withdrawn) A computer program product as recited in claim 62, wherein the inverse to said
7 forward transform is different from said inverse transform.

8 64. (withdrawn) A computer program product as recited in claim 62, wherein said forward
9 transform is a forward discrete cosine transform and said inverse transform is an inverse
10 discrete wavelet transform.

11 65. (currently amended) A program storage device readable by machine, tangibly embodying a
12 program of instructions executable by the machine to perform method steps for digitally
13 processing transform-coded data representing a phenomenon, said phenomenon
14 comprising one of: a spectral analysis, a spectrum analysis, an image, an audio clip, or a
15 video clip, said transform coded data having an original precision as real domain data
16 input for forward transformation and quantization in forming said transform coded
17 transform data, said method steps comprising:

18 performing an inverse quantization of said transform-coded data forming integer
19 transform data;

20 employing only said integer transform data while performing an inverse transform of said
21 integer transform data to the real domain directly forming high-precision numbers
22 having a precision greater than said original precision; and

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1 maintaining said greater precision while manipulating said high-precision numbers to
2 produce an effect in said one of: spectral analysis, spectrum analysis, image, audio
3 clip, or video clip.

4 66. (previously presented) A computer program product as recited in claim 65, wherein the step
5 of manipulating results in manipulated high-precision numbers, the computer readable
6 program code means in said computer program product further comprising converting
7 said manipulated high-precision numbers to integers and clipping the integers to an
8 allowed range forming converted data.

9 67. (withdrawn) A program storage device readable by machine, tangibly embodying a program
10 of instructions executable by the machine to perform method steps for digitally
11 processing transform-coded data representing a phenomenon, said method steps
12 comprising:

13 performing an inverse quantization of the transform-coded data forming transform data;

14 performing an inverse transform of said transform data to the real domain forming
15 high-precision numbers;

16 performing a forward transform of said high-precision numbers forming forward
17 transform data; and

18 performing a quantization of said forward transformed data forming quantized data.

19 68. (withdrawn) A program storage device readable by machine as recited in claim 67, said
20 method steps further comprising manipulating said high-precision numbers to produce an
21 effect.

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1 69. (withdrawn) A program storage device readable by machine as recited in claim 67, said
2 method steps further comprising converting said high-precision numbers to integers and
3 clipping to an allowed range forming converted data.

4 70. (withdrawn) A program storage device readable by machine as recited in claim 67, said
5 method steps further comprising:

6 entropy decoding coded data forming transform-coded data employing entropy decode;
7 and

8 entropy encoding the quantized data employing lossless entropy encode forming encoded
9 data.

10 71. (withdrawn) A program storage device readable by machine as recited in claim 70, said
11 method steps further comprising alternating said manipulating steps with said steps of
12 performing a forward transform, performing a quantization, entropy encoding, entropy
13 decoding, performing an inverse quantization, and performing an inverse transform a
14 desired number of times.

15 72. (withdrawn) A program storage device readable by machine as recited in claim 71, wherein
16 said coded data are compressed data, and each step of alternating implements a
17 compression/decompression cycle.

18 73. (withdrawn) A program storage device readable by machine as recited in claim 70, wherein
19 the phenomenon is image data encoded in the JPEG standard format.

20 74. (withdrawn) A method for digitally processing transform data in the real domain
21 representing a phenomenon, the method comprising:

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- 1 performing an inverse transform of said transform data to the real domain forming
2 high-precision numbers;
- 3 converting the high-precision numbers to integers which include out of range data; and
- 4 performing a forward transform of the integers forming forward transformed data.
- 5 75. (withdrawn) A method as recited in claim 74, further comprising manipulating the integers
6 to produce an effect.
- 7 76. (withdrawn) A method as recited in claim 74, further comprising:
- 8 performing an inverse quantization of transform-coded data to form the transform data;
9 and
- 10 performing a quantization of said forward transformed data forming quantized data.
- 11 77. (withdrawn) A method as recited in claim 74, further comprising clipping the integers to an
12 allowed range forming converted data.
- 13 78. (withdrawn) A method as recited in claim 76, further comprising alternating manipulating
14 steps with the steps of performing a forward transform, performing a quantization,
15 performing an inverse quantization, and performing an inverse transform a desired
16 number of times.
- 17 79. (withdrawn) A program storage device readable by machine, tangibly embodying a program
18 of instructions executable by the machine to perform method steps for digitally
19 processing transform data in the real domain representing a phenomenon, said method
20 steps comprising:

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1 performing an inverse transform of said transform data to the real domain forming
2 high-precision numbers;

3 converting the high-precision numbers to integers which include out of range data; and

4 performing a forward transform of the integers forming forward transformed data.

5 80. (withdrawn) A program storage device readable by machine, as recited in claim 79, further
6 comprising manipulating the integers to produce an effect.

7 81. (withdrawn) A program storage device readable by machine, as recited in claim 79, further
8 comprising performing an inverse quantization of transform-coded data to form the
9 transform data.

10 82. (withdrawn) A program storage device readable by machine, as recited in claim 79, further
11 comprising performing a quantization of said forward transformed data forming
12 quantized data.

13 83. (withdrawn) A program storage device readable by machine, as recited in claim 79, further
14 comprising clipping the integers to an allowed range forming converted data.

15 84. (original) A method as recited in claim 17, wherein said coded data are coded audio data.

16 85 (currently amended). A processing method for comprising digitally processing
17 transform-coded data representing a phenomenon, said phenomenon comprising one of: a
18 spectral analysis, a spectrum analysis, an image, an audio clip, or a video clip, said
19 transform coded data having an original precision as real domain data input for forward
20 transformation and quantization in forming said transform coded transform data, the
21 method step of digitally processing comprising:

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1 implementing an inverse quantization of the transform-coded data forming transform
2 data;

3 employing only said transform data while performing an inverse transform of said
4 transform data to the real domain directly forming high-precision numbers having
5 a precision greater than said original precision; and

6 maintaining said greater precision while manipulating said high-precision numbers to
7 produce an effect in said one of: a spectral analysis, a spectrum analysis, an image,
8 an audio clip, or a video clip.

9
10 86. (previously presented) A method as recited in claim 85, wherein the step of manipulating
11 results in manipulated high-precision numbers, and further comprising converting said
12 manipulated high-precision numbers to integers and clipping the integers to an allowed
13 range forming converted data.

14 87. (previously presented) A program storage device readable by machine, tangibly embodying a
15 program of instructions executable by the machine to perform method steps for digitally
16 processing transform-coded data representing a phenomenon, said method steps
17 comprising the steps of claim 85.

18 88. (currently amended) A system for digitally processing transform-coded data representing a
19 phenomenon, said phenomenon comprising one of: a spectral analysis, a spectrum
20 analysis, an image, an audio clip, or a video clip, said transform coded data having an
21 original precision as real domain data input for forward transformation and quantization
22 in forming said transform coded transform data, the system comprising:

23 a first inverse quantizer to generate an inverse quantization of the transform-coded data
24 forming transform data;

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1 a first inverse transformer to produce an inverse transform of said transform data to the
2 real domain directly forming high-precision numbers having a precision greater
3 than said original precision employing only said integer transform data; and

4 a manipulator for manipulating the high-precision numbers to produce an effect in said
5 one of: a spectral analysis, a spectrum analysis, an image, an audio clip, or a video
6 clip, while maintaining said greater precision.

7 89. (currently amended) An article of manufacture comprising a computer usable medium having
8 computer readable program code means embodied therein for causing digitally processing
9 of transform-coded data representing a phenomenon, said phenomenon comprising one
10 of: a spectral analysis, a spectrum analysis, an image, an audio clip, or a video clip, said
11 transform coded data having an original precision as real domain data input for forward
12 transformation and quantization in forming said transform coded transform data, the
13 computer readable program code means in said article of manufacture comprising
14 computer readable program code means for causing a computer to effect the steps of:

15 implementing an inverse quantization of the transform-coded data forming transform
16 data;

17 employing only said integer transform data while performing an inverse transform of said
18 transform data to the real domain directly forming high-precision numbers having a
19 precision greater than said original precision; and

20 maintaining said greater precision while manipulating said high-precision numbers to
21 produce an effect.

22 90. (currently amended) A computer program product comprising a computer usable medium
23 having computer readable program code means embodied therein for causing digital processing
24 of transform-coded data representing a phenomenon, said phenomenon comprising one of: a

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1 spectral analysis, a spectrum analysis, an image, an audio clip, or a video clip, said transform
2 coded data having an original precision as real domain data input for forward transformation and
3 quantization in forming said transform coded transform data, the computer readable program
4 code means in said computer program product comprising computer readable program code
5 means for causing a computer to effect the functions of:

6 a first inverse quantizer to generate an inverse quantization of the transform-coded data
7 forming transform data;

8 a first inverse transformer to produce an inverse transform of said transform data to the
9 real domain directly forming high-precision numbers having a precision greater than said
10 original precision employing only said transform data; and

11 a manipulator for manipulating the high-precision numbers to produce an effect in said one of:
12 spectral analysis, spectrum analysis, image, audio clip, or video clip, while maintaining said
13 greater precision.

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